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LESS FUEL, LESS WORK, MORE RICE

by Mallika Wanigasundara

Agricultural scientists estimate that about half of Asia's increasing demand for rice -- about 6 million tons per year -- could be met simply by increasing production from existing farmlands. And one way to do that, they say, is by turning out simple machines to help the small-scale farmer get more produce from his paddy.

Sri Lanka is a leader in the development of such simple technology. Homegrown devices include a planter that eliminates the need for ploughing, a sprayer that cuts herbicide use by over 90 percent, and a Sri Lankan version of the traditional Dutch windmill.

Thirty years ago there were about 50,000 water lifting devices in Sri Lanka that did not require fossil fuels. Among them were a local water wheel, the Persian water wheel, and the well-swing. But with the introduction of the kerosene-powered 2-inch pump, these gradually went out of use.

Today 50,000 to 70,000 irrigation pumps are known to operate on kerosene, consuming at least 150,000 gallons of fuel per day. Not only does this put a strain on the country's already inflated oil bill (Rs 11,500 million for 1981), but it is also a drain on the budget, as kerosene is highly subsidized in Sri Lanka.

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Now Sri Lanka's Water Resources Board is trying out a locally-made windmill in several areas of the country in order to cut down on the use of oil and help expand agricultural production. Fifty of the windmills are now being tested in dry zone areas.

In the driest parts of the country the winds are strongest during that time of year when there is no rain, and consequently no agriculture. During this period that groundwater can be tapped with windmills, and cropping patterns need no longer be tied to rainfall.

The programme began in 1978, with some design assistance from Dutch windmill experts. Constructed in wood, the windmill has metal sails and plates, and plastic pipes. The idea was to turn out a mill that could be fabricated by local carpenters and blacksmiths. It makes for greater self-reliance among the farmers.

The windmills had to be designed to suit wind regimes, the availability of groundwater, and the size of the farms. The first model cost RS 18,000 (about US$1,000) and could lift 25,000 gallons of water a day. But most dry zone areas do not have that quantity of groundwater, and the 2-5 acre farms do not need so much water. The latest model has a smaller capacity and costs only about RS 6,000.

Two other devices now being introduced by the Department of Agriculture will not only help to conserve that water, but also reduce two of the farmer's dreariest chores: ploughing and weeding. With the introduction of the controlled droplet applicator (CDA) and the rolling injection planter (RIP), "no-till" farming has come to Sri Lanka. And some of the machines have already been exported to Africa and Indonesia.

The chores of ploughing and weeding not only take up human energy, but are time-consuming as well. Ploughing with tractors takes less time, but costs about

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RS 760 a hectare. Freed of this drudgery the farmer would have more time and more money to cultivate more land. Or he could get more crops off the same land.

With this equipment the soil does not have to be prepared in the conventional manner. Says Ray Wijewardene, of the International Institute for Tropical Agriculture's office in Colombo: "In cultivating an acre of field just four inches deep a farmer has to move 500 tons of soil....and tillage for weed control needs soil to be turned over several times."

Another advantage of the no-till method is that the farmer does not have to wait for the heavy rains to saturate the land with water before he can go ahead with sowing. He can do so when the soil is just moist enough, say after one bout of rain.

The field is usually covered with old stubble and mulch after the last cultivation. The CDA is a herbicide sprayer with a long handle and a drum at the top to hold the chemical. With it the farmer can spray very small doses of herbicide over the field. He uses only 2 or 3 gallons per acre instead of about 40 gallons used with conventional farming methods.

The spraying has to be done with selected pre-emergent herbicides that inhibit the growth of weeks but do not affect the paddy, other grains, or pulses. About 10 days later the RIP can be dragged along the field, which has not been ploughed. The seeder injects the seeds into the soil at desired distances, and they are automatically covered with soil.

When the seedlings appear they look as if they have been transplanted. Before the plants come up further, another very spare application of herbicide has to be made with the CDA. The rice plants are then left to grow, and all they need is water and the usual dressing of urea.

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By reducing both his labour requirements and his dependency on erratic rainfall, these simple devices could do much to improve the lot of the dry zone farmers, and at the same time help to increase Sri Lanka's rice production.

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